

Cohesive token passing algorithm utilizing software agents

ABSTRACT

The communications domain has utilized the implementation of protocols for a wide spectrum of applications. This encompasses Medium Access Control (MAC) protocols. MAC protocols have been extensively researched from several angles. This encompasses the implementation in the area of Wave Division Multiplexing (WDM) networks and Mobile Adhoc Networks (MANET). The relevance of intelligence in sustaining the pre-requisites for dynamic reconfiguration has gained an integral attention in MANET. Approach: The implementation of Token Ring in MANET can be correlated to its complementary implementation in IP networks. In this paper, the limitation of Token Ring algorithm for IP networks in the context of intelligent processing has been researched extensively. An enhanced Token Ring protocol governed by intelligent processing has been implemented in this paper. The core of the new protocol is based on the circulation mechanism of the token. As opposed to the traditional circulatory mechanism, a software agent is designed to become an intelligent circulatory agent is this research. The developed software agent is utilized to implement prioritized token access subject to the traffic type. Each station is coupled with a software agent who cohesively collaborates to assign the token. Results: The proposed agent and the enhanced Token Ring implementation have been extensively verified through simulation experiments. A complete circulation of the ring is defined upon all nodes being visited at least once. Discrete-event simulation models were developed and deployed for the purpose of performance analysis. The results acquired validated the improved results of the new software agent based implementation. The performance metrics studied were average delay and average buffer utilization. Conclusion: The proposed algorithm has enabled to derive an ideal balance between the complexity of intelligent processing and the versatility of managing the token ring.

Keyword: Software agents; Cohesive medium access control; Discrete-event simulation models